

## **SURAT KETERANGAN**

Nomor: 526/UNUSA/Adm-LPPM/XI/2018

Lembaga Penelitian dan Pengabdian Kepada Masyarakat (LPPM) Universitas Nahdlatul Ulama Surabaya menerangkan telah selesai melakukan pemeriksaan duplikasi dengan membandingkan artikel-artikel lain menggunakan perangkat lunak **Turnitin** pada tanggal 07 November 2018.

Judul : Effectiveness Of Probiotic Supplement To Glucose Level Toward Gestastional diabetes  
Penulis : Elly Dwi Masita  
Identitas : The Proceeding Of International Nursing Conference  
No. Pemeriksaan : 2018.11.13.123

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# EFFECTIVENESS OF PROBIOTIC SUPPLEMENT TO GLUCOSE BLOOD LEVEL TOWARD GESTASTIONAL DIABETES MELITUS

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**Submission date:** 07-Nov-2018 08:40AM (UTC+0700)

**Submission ID:** 1034334233

**File name:** Manuscript\_20116\_Probiotik\_dan\_GDM.doc (79K)

**Word count:** 1994

**Character count:** 11509

# EFFECTIVENESS OF PROBIOTIC SUPPLEMENT TO GLUCOSE BLOOD LEVEL TOWARD GESTASTIONAL DIABETES MELITUS

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## Abstract

Introduction :Gestastional the prevalence of diabetes mellitus in Indonesia reached 1.9%-3.6% in the entire of pregnancy and has increased every year. Gestastional of diabetes mellitus risks of preeclampsia, abortion, polyhydramnion, infections, uterine contractions disorder, partus long, operation caesar risk, post delivery bleeding and occurs diabetes mellitus sequel. In infants occur makrosomia, hypoglycemia in the first 24 hours of birth, congenital defects, hypokalsium, hyperbilirubin, coroner and kidney disorders, neuro and skelet disorders, this condition increasing the death rate of mothers and babies. Research purposes to know the different blood glucose level before and after given probiotic supplementation for 7 days every day on gestastional diabetes. This type experiments research with pre test and post test control. Sampling used a purposive sampling, the sample was 36subjek with pair t testanalisis. Result of paired t test is  $p < 0.05$ .Results is there are influence supplement probiotic giving to blood glucose levelwitht test prandial blood glucose level  $p = 0.001$ , 2 hours post prandial blood glucose level  $p = 0.001$ . Conclusion: there is influence probiotic supplement giving on blood glucose levels on gestastional diabetes mellitus

Keywords: Probiotic, Blood Glucose Level, GestastionalDiabetes

## INTRODUCTION

Getastional diabetes melitus in Indonesia have a prevalence of 1.9%-3.6% with overall of pregnancy. In Surabaya has increasing every year. In 2013 there is pregnancy with diabetics 71 and in 2014 increasing to 86 (Health Office, 2014)

Complication accurs of pregnancy, childbirth, post partum soincreasing mother child death rate. Risks of mother arepreeclampsia, abortion, polyhidramnion, infection, contraction uterine disorder, long first delivery periode, risky of caesarean, infection and bleeding post partum and diabetes mellitus sequel.Infants by 5/10,000 of births are makrosomia, hypoglycemia, congenital defects , defect of birth, abnormalities of heart, kidneys, neuro and skelet, hypokalsium, hyperbilirubun, asphyxia syndrome and breath failure. Cause of is insulin produced insufficient by the body not enough so metabolism of glucose through cell membrane had disturbed with trigged by hormonal placenta lactogen, diet, heredity, stress, smoking, obesity, excessive carbohidaratconsumtion, chemicals or medicines and pancreatic cell damage by viral , bacterial infections (Syaifudin cited by Sukarya, 2008). Symptom and signsarepolyuria, polydipsia, dizziness, obesity, nausea and vomiting, obesity, high-fundus uteri is greater than gestational age,

weak body, tingling, itching, haze, pruritus vulva, ketonemia, glikosuria, blood glucose 2 hours post prandial  $> 200$  mg/dl , blood glucoseprandial  $> 126$  mg/dl (Syaifudin cited by Sukarya, 2008).

Hariadi Cited by Juwono(2005) menagementincludes screening, managingpatern, administering insulin and specific antenatal care. Screening can be done with indication of obesity, having diabetes mellitus history on, have a history of urine glucose intolerance, and having family history of type 2 diabetes mellitus . If risks of factors are found do TTGO test and had reviewed test in 24-28 weeks and maintain prandial blood glucosalevel $<105$  mg/dl and blood glucose post prandial $< 120$  mg/dl (Juwono, 2005; Sukarya, 2008).

Management had not donemaximum yet, especially of patterns foodso has increasing every year and still to find abnormal blood glucose control. Unsuccessfullyis caused by less knowledge level and disobey with concerning recommended pattern

Probiotic is living microbes actively improving health of consumers by balancing digestive tract microflora if taken on living conditions with sufficient able to regulate immune responses fragment potentially antigenic food, removes bacterial pathogen adhesion, replace with bacteria non pathogen ,modify genetic strain of bacteria to produce

antibodies, enzymes and cytokines (Zhang, Y *et al.*, 2013; Osta'dhrahimiet *al.*, 2000, Firouzi *et al.*, 2015). Probiotic safe for pregnancy and lactation, improve lipid profile, glucose tolerance, insulin secretion, decrease plasma cytokines pro inflammation (Loegircioet *al.*, 2005; Shavakiet *al.*, 2013).

A preliminary study at November 2015 showing that 10gestastinaldiabetes haddecreased blood glucose 1-2 mg/dl after had given probiotic supplement drink for 7 days. Research of probiotic with human subject is Loegircioet *al.* (2005) probioticcan to manipulate intestinal flora, increase cytokine pro inflammatory and hepatoprotector so beneficialfor chronic liver disease. In line with researchabove is Alleret *al.* (2011), probiotics improvelevels of ALT, AST, GT-<sup>3</sup> and research of Dong, *et al.* (2013) probiotic lactobacilluscaseishirota significant increases activity of NK cells and antibodies

#### RESEARCH METHOD

Design of research hasexperiments with pre and post control. The population of 81 subject with gestastional diabetes mellitus and sample consist of all gestastional diabetes in Surabaya. The sampling using purposive sampling with a total sample of 36 sample control and treatment groups 36 sample. This study has two variables. The variable are supplement probiotic as dependent variable and blood glucose level as independent variabls. This study to be done since oktober 2015 until desember 2015 at local government clinic. Blood glucose level had taken by digital equipment trough artery blood fingertip. The first process of ethical clearence is managing recommendation from center of health government, at second meet subject and explain about a purpose of study as well as safety probiotic supplement for pregnancy and infant and third to give agreement receipt and advise to signature informed concent as agreement of evidancedStatistical tests using paired t test (Dahlan, 2014)

#### RESULT

Table 1.1 Frequency distribution

Group mg/dl	N	Min	Maks
BGL pre	36	127	142
BGL post		110	120
BGL 2 PP pre		160	170
BGL 2 PP post		119	120
Paritas			
Trimester II	18		
Trimester III	18		

Source : 2015

Table 1.1 describe that prandial blood glucose level before given probiotic supplement of minimum level is 127 mg/dl and maksimum level of 142 mg/dl and after given probiotic supplement of minimum level is 110 while maksimum level of 120 mg/dl. While 2 hour post prandial blood glucose level before suplentof minimum level is 160 mg/dl and maksimum level of 170 mg/dl, but after supplement of minimum level is 119 mg/dl and maksimum level is 120 mg/dl. The paritas are trimester II of 50 % and trimester III of 50%

Table 2.1 Normality result test with Kolmogorov Smirnov

Group	p > 0.05
Pair BGL prandial pre – post suplement	0.383
Pair BGL 2 hour post prandial pre –post suplement	0.083

Source : 2015

Tabel 2.1 has explaining normality test with kolmogorovsmirnov test and significant of blood glucose prandial p = 0.383 (p>0.05 ) it means the distribution is normal as wel as with 2 hour post prandial test on signifikansi p= 0.083 ( p> 0.05 ) that means distribution is normal

Table 3.1 Paired statistic test

Pair group	Mean	N	Std. Dev	Std. Error
mg/dl				Mean
Pair 1 BGL pre	137	36	3.461	.577
BGL post	112	36	3.692	.615
Pair 2 BGL2jampre	166	36	2.620	.437
BGL2jampost	120	36	.351	.058

Source : 2015

Table 3.1 describe that mean before supplement of 137 mg/dl for prandial blood glucose level and after supplement of 112 mg/dl. This condition indicates that there is a decrease in the levels of prandial blood glucose by 25 points,

While 2 hour post prandial blood glucose level before supplement of 166 mg/dl and after supplement of 120mg/dl. This condition indicates that there is a decrease in the levels of 2 hour prandial blood glucose by 46 points

Table 5.1 Paired sample t test

Group	mg/dl	Paired Differences				t	df	p
		Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference			
					Lower			
					Upper			
Pair 1	BGLpre - BGLpost	24.75	3.69	.61	23.49	26.	40.15	35 .001
Pair 2	BGL2 jam pre-BGL2jampost	45.77	2.66	.44	44.87	47	103.13	35 .001

Source :2015

Tabel 5.1 explain paired t test results obtained  $p = 0.001$  that means 1 tablespoon probiotic supplement mixed with 250 cc of drinking water for 7 days every day impact on blood glucose levels in pregnancy with diabetes mellitus (Sakai *et al*, 2011; Glessonet *al*, 2015). The means of prandial blood glucose level before and after supplement of 25 mg/ dl (  $M= 24.75$  ;  $SD = 3.69$  ) and 46 mg/dl for blood glucose level 2 hour post prandial ( $M=45.77$ ;  $SD = 2.66$  )

Table 4.1 Paired t test correlation

Group	mg/dl	N	Correlation	p
Pair 1	BGLpre&GDLpost	36	.467	.004
Pair 2	BGL2jam pp pre & BGL2jamp p post	36	-.056	.745

Source : 2015

Table 4.1 explain that r squared of prandial blood glucose level of  $0.467^2$  (0.21 ) and significant with  $p = 0.004$ . That means probiotic supplement 1 tablespoon every day which mixed 250 cc drinking watercan to impact prandial blood glucose level in constant of 21% while 79% had affected by other factors. But in 2 hour post prandial blood glucose level of  $- 0.056^2$  (0.003) with sigifikansi  $p = 0.745$  that means probiotic supplementhas no effect in significant2 hour blood glucose post prandial level of 0.03% while 99 % had affected other factors.This condition indicates that there is a change in the levels of glucose 2 hour post prandial but not consistent. Most had turned lower and most had not changed

## DISCUSSION

Paired t test results is  $p < 0.05$ that means that prandial blood glucose levels experience a change of 3 mg/dl and 2 hour of post prandial blood glucose of 3mg/dl after a given probiotic supplements. This condition cause of ability of probiotic to manipulate mikrota intestinal flora.The equilibrium of intestinal flora can to secrete cytokines and to increase hepatoprotectorso beingtoreduce fat perioksidasi and able to improve the layer cells damaged by free radicals. In addition, to probiotics are able to fix  $\beta$  cells of pancreas



damaged so stabilizing of insulin metabolism and improve blood glucose (Loegircio, 2005; Takeda, 2007; Dong, 2013)

#### CONCLUSION AND RECOMMENDATION

There is on influence of probiotic supplements concerning blood glucose levels toward gestational diabetes mellitus is  $p < 0.05$  ( $p=0.001$ ) so given probiotic supplement had recommended for gestational diabetes mellitus as blood glucose balanced and supplement probiotic given need to be accompanied by the expert

#### ACKNOWLEDGMENT

This study has been supported by biojannah and bioterra company which probiotic product, Central Java. Indonesia. The author are greetfull to gestational diabetes mellitus suffers as kind collaboration and overall helping in making this study posible

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APPENDIX

# EFFECTIVENESS OF PROBIOTIC SUPPLEMENT TO GLUCOSE BLOOD LEVEL TOWARD GESTASTIONAL DIABETES MELITUS

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